



EcoLogo®

Environmental Standard - Certification Criteria Document

CCD-003:

Renewable Low-Impact Electricity Products

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CCD-003 Renewable Low-Impact Electricity Products



Table of Contents

Introduction	1
Definitions	3
Category Definition	14
General Requirements	14
Generation Requirements	14
Technology-Specific Generation Requirements	16
Non-Generation Requirements	21
<i>Bundled Renewable Low-Impact Electricity</i> Product Requirements	24
<i>Renewable Energy Certificate (REC)</i> Product Requirements	26
Verification Requirements	27
Conditions for EcoLogo Use	29
Revisions to this Standard	30
Appendix 1: Air Emissions Testing Frequency, Conditions and Methods	31
Appendix 2: Load Point Determination	33

CCD-003 Renewable Low-Impact Electricity Products



Introduction

The EcoLogo® Program is pleased to publish the following version of the *Renewable Low-Impact Electricity Products Standard*.

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The EcoLogo Program is designed to support a continuing effort to improve or maintain environmental quality by, for example, reducing energy and materials consumption and by minimizing the impacts of pollution generated by the production, use and disposal of goods and services available to North Americans.

Based on a review of currently available life cycle information and consideration of the markets and stakeholder input, the top environmental performers in the electricity sector have been identified. These best performers have demonstrated that, compared to others on the market, they have an overall reduced burden on the environment. Some of this reduced burden can be manifested in:

- the displacement of non-*renewable* fuels by *renewable*, more sustainable fuel sources;
- lower air emissions that contribute to climate change, smog, acid rain and air-borne particulate pollution;
- the reduction of solid wastes arising from both the mining and extraction of non-*renewable* fuel sources, and the disposal of toxic metal emissions and nuclear wastes; and
- the reduction of impacts on aquatic, *riparian* and terrestrial ecosystems from electricity generating activities.

Standard development is an ongoing process. As information and technology change, the product category requirements will be reviewed and possibly amended.

The EcoLogo Program anticipates that *generators* and *marketers* of electricity that conform to this standard will apply to the EcoLogo Program for verification and subsequent authority to label qualifying products with the EcoLogo. The EcoLogo Program maintains verification protocols that clearly define the terminology and associated criteria limits of this standard.

CCD-003 Renewable Low-Impact Electricity Products



Notice: Throughout this document, any reference to a law, regulation, standard, guideline or test method means to its latest edition.

The EcoLogo Program reserves the right to accept equivalent test data for the test methods specified in this document. Equivalent test methods will be identified in interpretations appended to the end of the standard.

Definitions

In this standard, the defined terms are italicized. The definitions are:

“biogas” means gaseous products (primarily methane and carbon dioxide) produced by the anaerobic decomposition of organic wastes. For the purpose of this standard, facilities producing *biogas* include sewage treatment plants, manure and other farm and food/feed-based anaerobic digestion processing facilities, and excludes landfill gas;

“biogas-fuelled electricity” means electricity generated from a system in which *biogases* are captured for combustion and conversion to electricity;

“biogenic” means from recently living plants and animals that have died 80 or less years ago;

“biomass” means vegetative matter or its derivatives including:

- a) solid *biomass* removed from fields and forests which are managed by following *sound environmental management practices*. Solid *biomass* can either be whole plants, parts of plants, or *harvesting and industrial by-product residues* arising from the harvesting and processing of agricultural crops or forestry products that would otherwise be land filled or incinerated;
- b) *dedicated energy crops*; and
- c) liquid fuels derived from *biomass* as defined in items (a) and (b) above, including among other things ethanol, biodiesel, and methanol.

Eligible *biomass* fuels exclude manufacturing process by-products that have been treated in the manners listed below to prevent toxic emissions:

- a) wood coated with paint, plastics or formica;
- b) wood treated with preservatives containing halogens, chlorine or halide compounds like chromated copper arsenate or arsenic;
- c) wood that has been treated with adhesives; and
- d) railroad ties.

CCD-003 Renewable Low-Impact Electricity Products



If the treated *biomass* types comprise 1% or less by weight of the total *biomass* used to generate electricity at a particular facility and the remainder is from eligible sources of *biomass*, all *biomass*-derived electricity may be eligible with prior approval from EcoLogo;

“biomass-fuelled electricity” means electricity generated through the combustion of *biomass*;

“broker” means an entity that puts a seller of a *REC* or *bundled renewable low-impact electricity* product in contact with a buyer of these products. The *broker* is not an owner of *REC* or *bundled renewable low-impact electricity* products at any point in the process;

“bundled renewable low-impact electricity” means a combined transaction in which *RECs* and electricity are sold together. *Bundled renewable low-impact electricity* can come from the initial *generating facility* or be, with restrictions as defined in this standard, bundled with a *grid power mix*;

“bypassed reach” means that area in the waterway between the initial point where water has been diverted through turbines or other mechanical means for *water-powered electricity* generation and the *tailrace*;

“captive” rate-based customers” means *utility* clients who have no choice but to purchase electricity from their local utility if on-grid;

“CITES” means the Convention on International Trade in Endangered Species of Wild Fauna and Flora;

“CO” means carbon monoxide, and should be measured using the testing frequency, conditions and methods specified in Appendix 1 of this standard;

“concentrating solar thermal technology” means a system that concentrates the heat of the sun through collectors, and uses the collected heat to drive a generating system to produce electricity;

“Cumulative Effects Analysis” means an analysis performed following the Council on Environmental Quality’s recommendations;

“Cumulative Effects Assessment” means a cumulative assessment performed following the *Cumulative Effects Assessment Practitioners Guide* of the *Cumulative Effects Assessment Working Group*;

“dedicated energy crops” means those non-food crops grown specifically for their fuel value, and in the case of this standard, for electricity generation. These sources include: short-rotation woody crops (e.g., poplar trees) and herbaceous energy crops (e.g., switch grass);

CCD-003 Renewable Low-Impact Electricity Products



“de-inking sludge” means solid material filtered out of the wastewater from the process used to remove ink and other undesirable materials from printed wastepaper;

“diversion” means the construction of works to divert water into a canal, tunnel, penstock or similar conduit to supply water for electricity generation purposes;

“chlorine” means the gas in its elemental form (Cl_2);

“ecological values” means, in the context of forestry, the ecological attributes that are maintained by following *sound environmental practices*;

“end-user” means the final purchaser or recipient of a *REC or bundled renewable low-impact electricity product*. An *end-user* could be anyone who consumes a *bundled renewable low-impact electricity product* or promotes themselves in relation to a *REC purchase*. An *end-user* could be a residential or commercial customer, a *marketer* or a *generator*. Additionally, an *end-user* could have an on-going contractual agreement for the delivery of a *REC or bundled renewable low-impact electricity product*, or could be receiving a *REC or bundled renewable low-impact electricity product* on a one-time use basis;

“environmental attribute” means the representation of the environmental costs and benefits associated with a fixed amount of electricity generation, usually from a specific *generation facility*;

“environmental benefits” means the beneficial *environmental attributes* of a *generation facility*. In the context of this standard, the environmental benefits result from the generation of *renewable low-impact electricity*. These benefits can include among other things the displacement of non-renewable fuels, the reduction of air emissions, the reduction of solid and nuclear wastes, and the reduction of impacts on aquatic, *riparian* and terrestrial ecosystems;

“eutrophication” means the process by which a body of water becomes enriched in dissolved nutrients (e.g., phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen;

“farm and food/feed-based biogas systems” means *biogas-fuelled electricity systems* in which *biogases* are based on the anaerobic digestion of plants including *dedicated energy crops* and animal residues (including manure) with no remaining food market value;

“fish habitat” means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes;

CCD-003 Renewable Low-Impact Electricity Products



“fish passage” means both the upstream and downstream migration of fish that can be ensured with the use of natural and/or human-made methods. Human-made methods include among other things fishways, fish ladders, fish locks, fish elevators, powerhouse collection galleries, *diversion* screens, and by-pass facilities;

“fossil” means from coal, petroleum, natural gas or any of their derivatives;

“generation facility” means a power station designed and built to produce electricity;

“generator” means an entity that owns and operates a *generation facility* or multiple generation facilities;

“geothermal-powered electricity” means electricity generated from a system that uses hydrothermal steam or water;

“greenhouse gas (GHG)” means a gas that is considered to contribute to climate change and includes, among other things, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O);

“grid” means a network of wires and cables that transport electricity from *generation facilities* to *end users* situated elsewhere;

“habitat compensation” means the replacement of habitat that has been subjected to *harmful alteration, disruption or destruction* with newly created habitat or improvement of the productive capacity of some other natural habitat;

“harmful alteration, disruption or destruction” means, with respect to *fish habitat*, any change to *fish habitat* that reduces, or eliminates, its productive capacity in relation to one or more life processes of fish;

“harvesting and industrial by-product residues” means these forms of *biomass*:

- a) silviculture and logging residues not needed to be retained for *ecological values*;
- b) crop and animal residues with no remaining *human food market value* and not needed for soil nutrient balance and management (e.g., straw, chaff, corn cobs, bean residues, and dried stalks of harvested grain);
- c) mill residues (e.g., residual by-products associated with the processing of forest materials such as bark, sawdust, solid trim, shavings, veneer clippings, clarifier sludge, pulping liquors); and

CCD-003 Renewable Low-Impact Electricity Products



- d) untreated construction and demolition wastes that have been demolished in such a manner that they cannot be reused in their previous form;

“head pond” generally means the body of water immediately upstream of the intake structure of electricity *generation facilities*. *Head ponds* may be natural or human made (lands inundated, and/or water bodies created as a result of the construction of the generation station and/or the associated *diversion structure(s)*), or a combination thereof. *Head ponds* may serve one or more purposes including, but not limited to:

- a) providing the appropriate hydraulic characteristics, such as submergence, for the intake structure;
- b) increasing the available head of the *generation facility*; and
- c) storing water for subsequent discharge through the *generation facility*.

Head ponds also include changes caused by the *diversion* of a portion of a river through a canal or penstock;

“high conservation value forests” means forests of outstanding and critical importance due to their environmental, socio-economic, cultural, biodiversity and landscape value;

“human food market value” means food that could be reasonably expected to be environmentally and cost-effectively transported to a place where it could be used for food purposes (e.g., is unspoiled, found in food markets);

“hydro-powered electricity” means electricity generated from a system or technology that uses a mechanical method to capture and convert the potential energy of water into electricity. Hydropower facilities use one-way water flow to generate electricity. There are two categories of hydropower plants, run-of-river and store and release. Not included in the definition of hydropower are pump storage or *instream-powered electricity*;

“instream flow” means the water volume flowing in a waterway;

“instream-powered electricity” means electricity generated from currents within a stream or river which has not been dammed or altered by a bypass reach;

“islanded grid” means a small *grid* system that is not connected to any of the large *provincial power pools* in Canada;

CCD-003 Renewable Low-Impact Electricity Products



“low net greenhouse gas emissions” means those emissions that are either mostly *biogenic greenhouse gases* and/or *life cycle greenhouse gas emissions* that are lower than the best fossil fuel systems. *Greenhouse gases* include: CO₂, C₄H and N₂O;

“marketer” means a commercial body that sells their *REC* or *bundled renewable low-impact electricity products* to interested buyers (e.g., residential, commercial or institutional buyers or other *marketers*). Note that a *marketer* possibly combines electricity from various sources and that sometimes, *marketers* are also *generators*;

“MW” means megawatt, a unit of electrical power capacity;

“MWh” means megawatt-hour, and a unit of electricity equal to one megawatt of power produced, consumed or flowing for a period of 1 hour;

“new renewable low-impact” means the age nature of an eligible facility that began operating or that was repowered after the indicated dates in the following table:

Year of Sale	New Date
2010	1997
2011	1997
2012	1998
2013	1999
2014	2000

The New Date will continue to advance by one year each year after 2014.

To be considered a *new renewable low-impact electricity product*, the facility from which the *REC* or *bundled renewable low-impact electricity product* was derived must have either been:

- a) placed in operation (generating electricity) on or after the applicable New Date; or
- b) repowered on or after the applicable New Date such that 80% of the fair market value of the project derives from new generation equipment installed as part of the repowering;

The definition of “new renewable low impact” electricity is relevant to some renewable energy markets and it is included in this standard primarily for attribution for marketing purposes of Renewable Energy Certificates. The standard applies to all renewable electricity facilities that meet the criteria in this document.

“NO_x” means nitrogen oxides, and should be measured using the testing frequency, conditions and methods specified in Appendix 1 of this standard;

CCD-003 Renewable Low-Impact Electricity Products



“null electricity” means electricity distributed on the *grid* from which RECs have been separated that has no associated environmental, social and premium economic attributes. Once all the *RECs* have been separated from the *renewable* low-impact electricity, the electricity becomes “null”;

“off-grid” means that a *generation facility* is not connected to any *islanded grid* or large *provincial power pools* in Canada;

“operational air emissions” means the quantity of air-borne emissions of a specified substance or compound that is released as a result of the generation of electricity;

“PCDDs and PCDFs” means polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo-furans, and is a family of chlorinated organic compounds formed as trace contaminants or by-products in industrial processes. This includes the undesirable toxic contaminants generated when chlorine is used in the bleaching of wood pulp and when *salt-laden wood* is combusted;

“planned generation facility” means a *generation facility* not yet producing electricity;

“PM” means particulate matter, including particulate matter less than or equal to 10 microns in size, and should be measured using the frequency and methods specified in Appendix 1 of this standard;

“photovoltaic (PV) technology” means a cell, module, panel, array and/or array field that directly converts light energy from the sun into electricity;

“provincial power pool” means any power pool of which a province is a part. This includes the provincial system itself, the North American Electric Reliability Corporation (NERC) region, the Independent System Operator (ISO) region, the Electric System Operator (ESO) region, the Regional Transmission Organization (RTO) region or the Balancing Authority Area;

“renewable” means replenished through natural processes or through sustainable management practices so that a resource is not depleted at current levels of consumption;

“renewable energy certificate” or **“REC”** means an authorized electronic or paper representation of the *environmental, social and premium economic attributes* associated with the generation of 1 *MWh* of *renewable* low-impact electricity. A *REC* is allowed to be passed on or sold as a separate product from electricity itself, or as part of a *bundled renewable low-impact electricity* product. For the purpose of this standard, where legally possible, only indirect GHG emissions from the consumption of purchased electricity are quantitatively included in the *REC*;

CCD-003 Renewable Low-Impact Electricity Products



“renewable portfolio standard” or **“RPS”** means a state, provincial or federal level policy that requires retailers to buy, or electricity suppliers to provide retail customers a minimum level of electricity generated from eligible *renewable* energy sources. A synonym of an RPS is a *Renewable Electricity Standard* (RES). The RPS usually specifies the minimum amount of electricity required (usually as a percentage) and those *renewable* resources that are eligible for inclusion (e.g., can include solar PV, wind, wave, tidal, low-impact hydro, low-impact *biomass*). Many such policies also specify, at least for a portion of the requirement, the date after which eligible *generators* must have begun operation;

“retirement” means the final disposition of a *REC* or *bundled renewable low-impact electricity* product in the market. It does not necessarily refer to the retirement of a *REC* in a particular web-based tracking system for the purpose of trading across tracking systems. Once a *REC* has been retired, it can longer be exchanged on the market;

“riparian” means the land and habitat found along the banks of streams, rivers and lakes;

“salt-laden wood” means timber and forestry residues that contain a high concentration of salt (NaCl), due to either a prolonged exposure to maritime air or to immersion in marine waters (generally for the purpose of transportation);

“solar-powered electricity” means electricity generated by converting the sun’s light energy and/or heat energy into electricity, and includes among other things *photovoltaic technologies* and *concentrating solar thermal technologies*;

“social impacts” means effects on community values like, for example, heritage, culture, recreation, landscape aesthetics, noise and/or tourism;

“sound environmental management practices” means those practices and goals used to manage forest and/or agricultural products within a *sound environmental management system*, as defined in the definitions section of this standard, that have the objectives of maintaining environmental values of the surrounding ecosystem. At a minimum, these practices must address among other things:

- a) species selection;
- b) soil structure, temperature and fertility;
- c) soil composition, compaction and conservation;
- d) erosion control;
- e) hauling distance from the harvesting site to the generation site;
- f) silvicultural practices and techniques;
- g) harvesting practices including techniques, rates and waste minimization;

CCD-003 Renewable Low-Impact Electricity Products



- h) crop regeneration;
- i) road/trail construction and maintenance;
- j) protection of biodiversity, wildlife and rare, threatened and endangered species;
- k) *water quality* and quantity;
- l) watershed conservation and *eutrophication* control; and
- m) prior land use;

“sound environmental management system” means a system, including among other things the International Organisation for Standardisation 14000 series of standards, used to manage forest and/or agricultural products that incorporates *sound environmental management practices*. At a minimum, system elements must include:

- a) planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; identifying environmental governmental environmental policies, regulations and guidelines and committing to meeting or surpassing these within an adaptive management framework; and defining and committing to environmental policies, objectives and targets;
- b) operational elements such as: defining roles and assigning responsibilities; providing adequate staff training; communicating environmental aspects and policies both internally and externally; implementing an environmental management program based on identified environmental aspects and impacts; documenting all policies, goals and procedures; periodically reviewing and, where necessary, revising the system; performing public consultation and/or outreach; and establishing an environmental emergency preparedness and response plan; and
- c) monitoring and measurement of elements such as: monitoring and measuring key aspects of the system; evaluating and mitigating negative environmental impacts; correcting non-conformance with the management system; performing internal reviews; and having third party audits performed;

The Canadian Standards Association (CSA), the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) forest management certification systems are potential examples of *sound environmental management systems* used to manage forest products. The EcoLogo Program reserves the right to investigate the background documentation which led *biomass* feedstock to receive one of these certifications to ensure that these adequately meet *sound environmental management practices* and explicitly address intensive *biomass* removals;

“SO_x” means sulphur oxides, and should be measured using the testing frequency, conditions and methods specified in Appendix 1 of this standard;

CCD-003 Renewable Low-Impact Electricity Products



“species designated as endangered or threatened” means any species that is listed as either “endangered” or “threatened” on recognized catalogues of such species. The default listing shall be that of the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and that of the Endangered Species Act in the U.S., or the relevant federal, provincial, territorial, state and/or local listings (e.g., Ontario’s Committee on the Status of Species at Risk in Ontario) that supersedes the former, where designations are more stringent;

“tailrace” means the point at which water is released back into the waterway below a generation station after being passed through turbines or other mechanical means to produce *water-powered electricity generation*;

“TEQ” means toxic equivalent, and is determined by multiplying the measured concentration level of a given congener by the appropriate I-TEF. By converting the measured concentration levels to a common basis, the *TEQ* quantities may be summed to provide a single representative quantity. For the purposes of this standard, *TEQs* are determined for 2,3,7,8-TCDD and 2,3,7,8-TCDF.

The seven congeners for which 2,3,7,8-TCDD *TEQs* shall be determined are 2,3,7,8-TCDD; 1,2,3,7,8-P5CDD; 1,2,3,4,7,8-H6CDD; 1,2,3,6,7,8-H6CDD; 1,2,3,7,8,9-H6CDD; 1,2,3,4,6,7,8-H7CDD; and OCDD. The ten congeners for which 2,3,7,8-TCDF *TEQs* shall be determined are 2,3,7,8-TCDF; 1,2,3,7,8-P5CDF; 2,3,4,7,8-P5CDF; 1,2,3,4,7,8-H6CDF; 1,2,3,6,7,8-H6CDF; 2,3,4,6,7,8-H6CDF; 1,2,3,7,8,9-H6CDF; 1,2,3,4,6,7,8-H7CDF; 1,2,3,4,7,8,9-H7CDF; and OCDF;

“tidal-powered and wave-powered electricity” means electricity generated from kinetic energy arising from tidal or wave action;

“utility” means any electricity service provider that has “*captive rate-based customers*”;

“water-powered electricity” means electricity generated from *hydro-powered electricity, instream-powered electricity and tidal and wave-powered electricity*;

“water quality” means characteristics of water, specifically including amount of dissolved oxygen, pH, total phosphorus, turbidity, transparency and chlorophyll, and any other item that is critical for ecosystem and human health;

“wind-powered electricity” means electricity generated from a *wind turbine* that converts the kinetic energy of the wind into electricity; and

CCD-003 Renewable Low-Impact Electricity Products



“wind turbine” means a system that uses air foils or blades attached to a drive shaft in order to capture the kinetic energy of the wind. The wind pushes against the blades/foils and spins a drive shaft. The drive shaft, either directly or indirectly through a series of gears, moves the *generator* to produce electricity.

CCD-003 Renewable Low-Impact Electricity Products



Category Definition

This category comprises two *renewable* low-impact electricity products which are likely to impose relatively low impacts on the environment and produce potential benefits including, among other things, *low net greenhouse gas emissions*, limited depletion of non-*renewable* resources, reduced emissions of other pollutants and reduced impacts on aquatic, *riparian* and terrestrial ecosystems and species.

These two products are:

- A) *Bundled Renewable Low-Impact Electricity*; and
- B) *Renewable Energy Certificates*.

General Requirements

Generation Requirements

To meet the requirements of this standard, a *REC* and a *bundled renewable low-impact electricity* product must initially be derived from *renewable* low-impact electricity that must:

- 1) meet or exceed all applicable governmental, industrial safety and performance standards;
- 2) be accompanied by evidence that¹:
 - a) appropriate consultation with communities and stakeholders has occurred, that issues of concern have been reasonably addressed, that reasonable mitigation of negative *social impacts* and environmental impacts, where applicable, has been carried out, and that unmitigated or immitigable social and environmental impacts, if they exist, are of limited scale and scope;
 - b) prior or conflicting land use, biodiversity losses and scenic, recreational and cultural values have been addressed during project planning and development;
 - c) a *Cumulative Effects Assessment* in Canada or a *Cumulative Effects Analysis* in the United States has been performed, or that such an assessment has been considered and if not performed, reasons why are provided;

¹ Evidence is not required for 2 a)b) and c) if the preexisting facility was built prior to federal and/or provincial requirements for consultation or previously exempt for another reason, for example size of facility.

CCD-003 Renewable Low-Impact Electricity Products



- d) a monitoring plan has been considered to monitor all of the stressors of potential environmental impacts addressed by this standard such that:
 - i) there is proof that a monitoring plan is in place that monitors these stressors; or
 - ii) if no monitoring plan is in place or if the monitoring plan is incomplete, there is proof that such a plan has been considered and if it was not pursued, reasons why are provided;
 - e) an appropriate waste management plan is in place for the proper waste minimization, re-use, sorted recycling and/or safe disposal of all solid waste resulting from the construction, generation and end of life phases of the electricity generation;
- 3) be generated in a manner that:
- a) all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including the Fisheries Act and the Canadian Environmental Protection Act for facilities located in Canada;
 - b) is reliable and practical (i.e., not in research and development stage but actually generating electricity);
 - c) an appropriate water management plan is in place for ancillary water uses if water is used during generation activities. This plan must include, where appropriate, water conservation and *water quality* considerations;
 - d) it is only attributable to:
 - i) the proportion of fuel heat input that is an eligible *renewable* low-impact source of power as defined by this standard; and
 - ii) the net value of *renewable* low-impact electricity produced (i.e., fossil fuels or grid power cannot be used to directly generate *renewable* low-impact electricity);
 - e) it will not jeopardize the survival or recovery of any *species designated as endangered or threatened*; and
- 4) be generated in the same calendar year, the first three months of the following calendar year and the last six months of the previous calendar year in which this *REC* or *bundled renewable low-impact electricity* product is sold.

Technology-Specific Generation Requirements

To meet the requirements of this standard, a *REC* and a *bundled renewable low-impact electricity* product must also initially be derived from *renewable* low-impact electricity that meet the technology-specific generation requirements and associated definitions in this standard such that:

5) for ***biogas-fuelled electricity***:

- a) the total of load points assessed for *operational air emissions* of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO_x , measured as NO_2) and sulphur oxides (SO_x , measured as SO_2), as determined in Appendix 2, does not exceed 6;
- b) from *farm and food/feed-based biogas systems*:
 - i) best practices applicable to local conditions for nutrient management of agricultural materials must be followed; and
 - ii) the project's nutrient management plan must show how by-product P and N will be beneficially used, and not allowed to contribute to *eutrophication* where this could become an adverse effect.

6) for ***biomass-fuelled electricity***:

- a) the total of load points assessed for *operational air emissions* of carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO_x , measured as NO_2) and sulphur oxides (SO_x , measured as SO_2), as determined in Appendix 2, does not exceed 6;
- b) *biomass* from species that are listed in the *CITES* Appendices must not be used;
- c) generated in recovery or power boilers from *biomass fuel* containing *salt-laden wood*, de-inking sludge or spent pulping liquors, the facility must not emit, in the exhaust gases, polychlorinated dioxins and/or furans in excess of the limits for new or rebuilt pulp and paper boilers burning salt-laden wood as specified in the Canadian Council of Ministers of the Environment's Canada Wide Standards for Dioxins and Furans;

CCD-003 Renewable Low-Impact Electricity Products



- d) generated from solid *biomass, harvesting and industrial by-product residues, or dedicated energy crops*:
 - i) these feedstocks must have been sourced from operations that have implemented a *sound environmental management system* and are adhering to *sound environmental management practices*;
 - ii) full disclosure of certified content must be provided where forest management certification documentation is submitted to prove compliance that a sound environmental system has been implemented and that sound environmental practices are being followed;
 - iii) forests must not be converted to plantations or non-forests except in very limited areas, when the forest is not a *High Conservation Value Forest*, and when the change leads to long-term conservation benefits;
 - iv) rates of harvest that do not exceed levels that can be sustained must be ensured;
 - v) no land must have been deforested and peatland drained for the purpose of growing non-woody crops; and
 - vi) genetically modified *biomass* sources must not be used.

7) for **geothermal-powered electricity**²:

- a) if a facility does not re-inject all spent geothermal fluids underground, best practices applicable to effluent management and discharge quality must be followed;
- b) if a facility re-injects spent geothermal fluids underground, it must not contaminate the surrounding surface water and groundwater outside of the well waters;
- c) all discharges to surface water must meet drinking water quality guideline levels;
- d) engineered solutions must be incorporated to avoid the leakage of acidic fluids to groundwater during the acid treatment of wells;
- e) mercury and hydrogen sulfide air emissions must be controlled following best practices and must not exceed applicable health standard levels;
- f) hazardous solid waste must be properly stored on-site and contained before final treatment and disposal at an appropriate hazardous waste facility;
- g) recoverable solids such as sulfur cake must be recycled to the extent feasible;

² Based on the International Finance Corporation's sections 1.1, 1.3 and 2.1 of the Environmental, Health and Safety Guideline for Geothermal Power Generation

CCD-003 Renewable Low-Impact Electricity Products



- h) drill cutting and fluids must be stored in tanks or sump lines with an impervious membrane, and must be re-used where feasible or disposed at appropriate hazardous waste sites; and
 - i) the facility must not be sited in a way that creates unacceptable health risks due to air or water emissions to nearby communities.
- 8) for ***water-powered electricity***:
- a) the generation facility must operate in compliance with all regulatory licenses and requirements, and/or other authorizations pertaining to fisheries (including, for facilities located in Canada, the Fisheries Act), without regard to waivers or variances that may be granted or authorized;
 - b) the generation facility does not operate under any authorization with terms and conditions allowing the *harmful alteration, disruption or destruction of fish habitat* unless:
 - i) such *harmful alteration, disruption or destruction* is not affecting the limiting factor controlling productive capacity; and
 - ii) *habitat compensation* is implemented such that loss of the affected habitat is replaced by the creation of similar habitat, supporting the same stock, at or near the development site within the same ecological unit such that the created habitat replaces lost productive capacity, within an approved safety factor;

For facilities located in Canada, these conditional authorizations include those issued under Section 35(2) of the Fisheries Act, by the Minister of Fisheries and Oceans or under regulations made by Governor in Council under the Fisheries Act.

CCD-003 Renewable Low-Impact Electricity Products



- c) generated from *hydro-powered electricity*:
 - i) within practical limits and subject to regulatory direction and approval, ensures that plant operations are coordinated with any other water-control facilities that influence water levels and/or flows operating on the same waterway, in order to mitigate impacts and protect indigenous species and the habitat upon which they depend;
 - ii) as a maximum, causes as much water to flow out of the *head pond* as is received in any 48-hour period;

In cases where this particular criterion cannot be met, EcoLogo will nonetheless consider certification if the applicant submits evidence that indicates those hydrological and ecological components key to sustainability of the surrounding watershed are maintained. As a minimum, this evidence must include environmental impact assessments and documentation from a formal public consultation process.

In cases where neither of the above conditions is met, the applicant can opt to apply to a multi-stakeholder and public Electricity Review Process to demonstrate equal or lower adverse environmental impacts.

- iii) operates such that reduced water flows in the *bypassed reach* and reaches downstream of *diversion dams* and/or dykes are not detrimental to indigenous aquatic and *riparian* species;
- iv) operates such that *instream flows* downstream of the *tailrace* are adequate to support downstream indigenous aquatic and *riparian* species at pre-project ranges;
- v) operates such that *water quality* in a *head pond*, a *bypassed reach*, reaches downstream of the *tailrace* and reaches downstream of any *diversion dams* and/or dykes remains comparable to pre-project quality in unaltered bodies of water or waterways within the local watershed;
- vi) operates such that any changes in water temperature caused by the facility in the *head pond* or in reaches downstream of the *tailrace* or downstream of any *diversion dams* and/or dykes are not detrimental to indigenous aquatic species;
- vii) provides *fish passage* when necessary for the purpose of maintaining pre-existing migration patterns for fish communities both upstream and downstream where a human-made structure is placed across a waterway where no natural barriers exist; and
- viii) provides any measures (including among other things trash racks, oversized intake structures designed to slow intake velocities, underwater strobe and sound, fish screens) necessary to minimize fish mortality that would occur through impingement and entrainment; and

CCD-003 Renewable Low-Impact Electricity Products



- ix) operates in compliance with all regulatory licenses, regulatory requirements and/or other authorizations regarding water levels and flows, without regard to waivers or variances that may be granted or authorized.
- d) generated from ***tidal, wave, and in-stream-powered electricity***:
 - i) sections 8) b) i) and 8) b) ii) above must be applied to marine mammal habitat; and
 - ii) generation activities are not expected to cause significant adverse effects on the fundamental hydrodynamic processes of a tidal or wave regime (energy flow, erosion, sediment transportation, and deposition) or on biological processes.
- 9) for ***wind-powered electricity***:
 - a) impacts from the generating facility and its structures on indigenous or migratory avian and bat species are minimized and mitigated;
 - b) the *generation facility* and its structures are not located in an area that is protected for avian and bat species designated as endangered or threatened;
 - c) the wind power *generators* are required to conduct migratory studies to evaluate the location of their facility in relation to migratory avian and bat species. When it is determined that the facility is in a migratory flyway and poses a reasonable risk to these animals, the facility owner must evaluate the various methods to protect such migratory species;
 - d) produced onshore:
 - i) construction activities or routine *wind turbine* operations do not cause excessive soil erosion such as silting of nearby drainage, streams, ponds, or lakes that would be harmful to aquatic or *riparian* species and/or increase erosion from steep slopes, plateau edges, or access roadways; and
 - ii) excavated soil is replaced, and uprooted vegetation replanted, after construction or scrapping, where this can be done without interfering with the operation and servicing of the wind *generation facility*;
 - e) generated offshore:
 - i) negative impacts to indigenous and migratory marine mammal, fish, and shellfish species must be minimized and mitigated; and
 - ii) the *generation facility* and its structures must not be located in an area that is protected for marine mammal, fish and shellfish designated as endangered or threatened.

CCD-003 Renewable Low-Impact Electricity Products



- 10) To meet the requirements of this standard, **solar-powered electricity** must be generated in such a manner that adequate arrangements (i.e., financial reserves) have been made for the proper disposal and/or recycling of all solid waste resulting from the manufacturing of solar cells and of the generation of electricity, including the disposal of batteries and machinery or equipment used in the generation process itself, that contains measurable levels of cadmium.

Non-Generation Requirements

To meet the requirements of this standard, a *REC* and a *bundled renewable low-impact electricity* product must be managed in such a way that:

11) a *generator*, a *broker* and a *marketer* must:

- a) not base such a product on *planned generation facilities*;
- b) not sell, market or otherwise transfer such a product if it has already been retired;
- c) sell, broker or otherwise transfer this product in blocks of at least 0.1 REC, 0.1 MWh per month or 0.1 MWh on a one-time use basis (this represents approximately 17% of the electricity used by an average household). One-time uses include amongst other things for trade shows, conferences, receptions and other events;
- d) not contribute to the double counting of such a product. For instance, a *generator*, a *broker* and a *marketer* must:
 - i) represent such a product in a way that it must not be double counted;
 - ii) not sell such a single product to multiple buyers; and
 - iii) not retire such a single product to meet multiple regulatory (e.g., *renewable portfolio standards*) or voluntary program requirements (e.g., institutional or company procurement policies, residential customer *renewable low-impact electricity* purchasing programs, and in certain instances, voluntary GHG trading programs). Such a single product must only be retired to fulfill one regulatory or voluntary program requirement;
- e) provide product disclosure information along with such a product which:
 - i) at minimum, is provided yearly to a product recipient end-user or marketer through contracts, pre-purchase contracts included;
 - ii) can be presented as a label, official certificate, information pamphlet and/or website information. A copy of all product disclosure and/or explanatory wording in its final format for release or publication must be provided to the EcoLogo Program upon request; and

CCD-003 Renewable Low-Impact Electricity Products



- iii) includes the following minimum information:
- (1) a description of what a *REC* or *bundled renewable low-impact electricity* product is;
 - (2) the date(s) of initial operation or repowering of the electricity facilities from which the product was derived. The age profile of the product can be represented by a range (e.g., "This product is from renewable low-impact electricity facilities that first came into operation between 1900-2007);
 - (3) the percentage of *new renewable low-impact* electricity product content (e.g., "This product contains 50% *new low-impact renewable electricity*.");
 - (4) the net quantity (in MWhs) of *renewable* low-impact electricity from which the product was initially derived;
 - (5) the physical location from where the product was derived and initially produced (i.e., the province or state, and country of the *renewable* low-impact electricity facility);
 - (6) the detailed resource(s) used to generate the product such as whether it is derived from: biomass, biogas, hydro, tidal, wave, wind, geothermal or solar power, and the percentages of each resource used in the initial *renewable* low-impact generation (e.g., "this product was derived from 50% wind and 50% solar power.") In such cases where resources are prone to fluctuations, a range representing the worst and best case scenarios anticipated must be provided (e.g., "If the wind blows as anticipated, this product will contain 25% wind and 75% biomass. If the wind does not blow, this product will contain 100% biomass"); and
 - (7) the standard version under which the product maintains certification (e.g., 2010 version).
- 12) a *generator*, a *broker*, a *marketer* and an *end-user* must:
- a) include in this product all of the *environmental benefits*, including *greenhouse gas* emissions benefits, attributable to the initial *renewable* low-impact electricity at the point of generation to the full extent possible based on current legal requirements. For instance, where legally possible, only indirect GHG emissions from the consumption of purchased electricity are quantitatively included in the *REC*;
 - b) base such a product amount on the actual associated amount of net *renewable* low-impact electricity from which this product was initially derived and not on the *generation facility's* capacity; and

CCD-003 Renewable Low-Impact Electricity Products



- c) not make claims about the *renewable*, low-impact, and social, premium economic and *environmental attributes* related to the initial *renewable* low-impact electricity generation of such a single product if all *RECs* have been separated from such product because, in such a case, this product no longer contains *renewable* low-impact electricity attributes and is considered *null electricity*;
- 13) a *generator*, a *marketer* and an *end-user* must not retire such a single product or have it retired on its behalf more than once; and
- 14) an *end-user* must:
- a) not market, sell or otherwise transfer such a single product;
 - b) be the only user permitted to make claims about *bundled renewable low-impact electricity* usage or *REC* purchases for self-promotion purposes. This includes in any printed, electronic or broadcast materials.

Bundled Renewable Low-Impact Electricity Product Requirements

Along with all the *General Requirements* outlined above, to meet the requirements of this standard, a *bundled renewable low-impact electricity* product must be managed in such a way that:

- 15) a *generator*, a *broker* and a *marketer* must only sell or otherwise transfer such a product while representing it as “*renewable low-impact electricity*” or “*green electricity*” if the initial *renewable low-impact electricity* from which its associated *REC* product was derived was part of the same or neighboring *provincial power pool* as where the *end-user* is consuming the *bundled renewable low-impact electricity* product. The associated *grid* power to which a *REC* is bundled must also come from the same or neighboring *provincial power pool*;
- 16) a *generator*, a *broker*, a *marketer* and an *end-user* must not:
 - a) contribute to the double counting of such a product. For instance, a *generator*, a *broker*, a *marketer* and an *end-user* must not both consume such a single product and sell or otherwise transfer this same product; and
 - b) derive this product from an *off-grid renewable low-impact electricity* generating facility or from an *islanded grid*;
- 17) an *end-user*:
 - a) must only consume a single *bundled renewable low-impact electricity* product one time. Once used, such a product is considered retired and it must no longer be consumed by anyone, sold, passed on, or donated to any entity;
 - b) must retire a *REC* product associated to the *bundled renewable low-impact electricity* or have it retired of its behalf once this *end-user* has consumed this *bundled renewable low-impact electricity* product. Once retired, this *REC* must no longer be part of any other *bundled renewable low-impact electricity* product, and must not be transferred to another entity; and

CCD-003 Renewable Low-Impact Electricity Products



- c) can only make claims about:
 - i) consuming *bundled renewable low-impact electricity* commensurate to the *bundled renewable low-impact electricity* purchased and consumed by such an *end-user*; and
 - ii) the use of a *bundled renewable-low impact electricity* product one time only when a recipient of this product. Once claimed as used, such a product is considered retired and it must no longer be used by anyone, sold, passed on, or otherwise transferred to any entity.

Renewable Energy Certificate (REC) Product Requirements

Along with all the *General Requirements* outlined above, a *REC* product must also be managed in such a way that:

18) a *generator*, a *broker* and a *marketer* must not:

- a) contribute to the double counting of such a product. For instance, a *generator*, a *broker* and a *marketer* must not both make self-promotion claims about the purchase of a single *REC* product that cannot be bundled and sell or otherwise transfer this single product. Note that such cases are not considered self-promotion claims:
 - i) when a *marketer* is making claims about their ownership of this product while marketing them to potential buyers in any printed, electronic or broadcast material (e.g., "We have *RECs* for sale"); and
 - ii) when a *broker* is making claims about this product in any printed, electronic or broadcast material for the purpose of passing on its ownership of this product from a buyer to a seller (e.g., "We can put you in contact with a *REC* seller who has X amount of *RECs* for sale"; and
- b) attach such a product to the grid mix outside of a particular or neighboring *provincial power pool* and sell or otherwise transfer it as "*renewable low-impact electricity*." These products can only be represented as *RECs*.

19) a *generator*, a *broker*, a *marketer* and an *end-user* can derive this product from an *off-grid renewable low-impact electricity* generating facility or from an *islanded grid*; and

20) an *end-user* must only claim the purchase of a *REC* product that cannot be bundled commensurate to this purchase for self-promotion purposes when an owner of this product. An example of such a claim includes: "Our company X has supported *renewable low-impact electricity* generation by purchasing of Y *EcoLogo RECs* this month (or other precise time period)." Once such a claim has been made, such a product is considered retired and it can no longer be transferred to any entity.

Verification Requirements

21) The EcoLogo Program, TerraChoice and their representative agents shall not, without the Licensee's prior written consent, or except as may be required by law, voluntarily disclose any information obtained that the Licensee advises (in writing at the time such information is obtained) is confidential, unless such information is:

- a) previously known by the EcoLogo Program, TerraChoice or their representative agents;
- b) otherwise available to the public; or
- c) subsequently legally acquired from other sources without any such restriction.

22) To verify that a *REC* or a *bundled renewable low-impact electricity* product meets the criteria stipulated in this standard, the EcoLogo Program will require access, as is its normal practice, to relevant quality control, production and transactional records and the right of access to electricity *generation facilities* upon request.

It is the responsibility of the applicant to provide sufficient information to allow verification that the *REC* or *bundled renewable low-impact electricity* product is in conformity with this standard. In particular, all relevant documentation produced in the context of the environmental assessment of a *generation facility* for whose electricity certification is sought shall be made available to the EcoLogo Program.

23) The Chief Executive Officer or the duly authorized representative of the Licensee must sign an Attestation of Compliance that states that:

- a) in the case of a *generator*:
 - i) all steps of the process required to generate *RECs* or *bundled renewable low-impact electricity* products meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA); and
 - ii) compliance with sections 3) a), 8 a) and 8) b) shall be attested to by a signed statement of the Chief Executive Officer or the duly authorized representative officer of the Licensee. Compliance with sections 8 a) and 8 b) shall also be confirmed by additional evidence including among other things correspondence from the authorized representative of each applicable government body that has issued a license and/or operating permit for the *generation facility*; and

CCD-003 Renewable Low-Impact Electricity Products



- b) the *renewable low-impact electricity* or *REC* product to be certified presently meets all applicable criteria as defined in this standard.

The EcoLogo Program must be advised in writing immediately by the licensee of any noncompliance, which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement. In the event of a dispute related to the suspension or termination of the license, the license agreement provides for arbitration.

- 24) An audit and verification of all EcoLogo *RECs* and *bundled renewable low-impact electricity* product transactions must be performed on an annual basis:
 - a) *Generators* producing an EcoLogo *REC* and *bundled renewable low-impact electricity* product must provide proof to the EcoLogo Program of the amount of EcoLogo certified electricity generated and sold in quantitative units (e.g., kWh or MWh);
 - b) *Marketers* must provide proof to the EcoLogo Program of the amount of EcoLogo certified *RECs* and *bundled renewable low-impact electricity* products received from generators and supplied to *buyers* in quantitative units (e.g., kWh or MWh); and
 - c) Large buying *end-users* must provide proof to the EcoLogo Program of the amount of EcoLogo certified *RECs* and *bundled renewable low-impact electricity* products received from *marketers* and consumed and/or claimed in quantitative units (e.g., kWh or MWh).
- 25) Through a verification and auditing process, reconciliation measures will be implemented to ensure that sales levels of complying *RECs* and *bundled renewable low-impact electricity* products do not exceed production/ supply levels and match consumption levels in the case of *bundled renewable low-impact electricity* or self-promotion claims levels in the case of *RECs*.
- 26) This audit and verification must be performed by an accredited third party. Internal audits performed by certified internal auditors will not be accepted as ongoing proof of compliance.
- 27) EcoLogo Program audit checklists, Sufficient Evidence Documents and other verification process documentation must be followed for all verification procedures.



Conditions for EcoLogo Use

- 28) Only licensees are authorized to use the EcoLogo mark and/or the words "EcoLogo", "EcoLogo RECs", "EcoLogo Certified Renewable Low-Impact Electricity" in their own marketing and communications materials if all of the following conditions are met:
- a) All pertinent certification and licensing criteria are fully satisfied;
 - b) The Chief Executive Officer or the duly authorized representative of the licensee has signed a License Agreement;
 - c) The Licensee has paid annual fees to the EcoLogo Program as outlined in their agreement with EcoLogo;
 - d) The estimate of the percentage of total *renewable low-impact electricity* consumption load over the total electricity usage of the end-user per unit time must be accurate in the case of certified *bundled renewable low-impact electricity*; and
 - e) All licensees must conform to the most recent edition of the EcoLogo Brand Guide.
- 29) The EcoLogo Program retains the right to review and approve marketing and communications materials using the EcoLogo mark and/or the words "EcoLogo", "EcoLogo RECs" or "EcoLogo bundled electricity."
- 30) The EcoLogo mark and/or the words "EcoLogo", "EcoLogo RECs" or "EcoLogo Renewable Low-Impact Electricity" must not be used in a manner that misrepresents the EcoLogo Program, the reasons for certification and what these products are.
- 31) Licensees of electricity products that cannot meet the requirements of this 2010 version of this standard, but that have maintained EcoLogo certification against a prior standard version and that have ongoing contracts for delivery of an EcoLogo-certified electricity product (e.g., PPAs) will be allowed to maintain EcoLogo certification against this prior version of the standard for these contracts. The product disclosure of these products will have to include the standard version year under which a product was certified.

CCD-003 Renewable Low-Impact Electricity Products



Revisions to this Standard

32) This standard is considered a dynamic document and may change over time to accommodate changes in the electricity marketplace, policy changes that affect electricity products, and/or innovations in electricity technology. For any substantial changes to the standard, the EcoLogo Program commits that:

- a) stakeholders will be solicited regarding substantive policy change issues; and
- b) at least one year of notice will be granted to utilities, *renewable* low-impact electricity *marketers* and other stakeholders before substantive changes go into effect, unless a more timely change is necessary to respond to a significant and imminent problem threatening the integrity of *renewable* low-impact electricity markets.

For additional copies of this standard or for more information about the EcoLogo Program, please contact:

TerraChoice Group

Toll Free: 1-800-478-0399, Telephone: (613) 247-1900, Email: info@ecologo.org



Appendix 1: Air Emissions Testing Frequency, Conditions and Methods

Compound / Pollutant	Testing Conditions and Frequency
Carbon monoxide (CO) Nitrogen oxides (NO _x) Particulate matter (PM) Sulphur oxides (SO _x)	<p>Frequency: As determined in the verification protocol negotiated between the EcoLogo Program and the <i>generator</i> specifically for each <i>generation facility</i>.</p> <p>Conditions: Testing must be performed at operational load. Emissions for load point values must be determined from the concentration measurements (ppm (v/v) converted to mg/m³ at 25°C) and flow rate (dry basis at 101.3 kPa and 25°C) in the duct or stack.</p>

Compound / Pollutant	Testing Methods
Carbon monoxide (CO)	<ul style="list-style-type: none"> i. <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or ii. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or iii. <i>Reference Method for Source Testing: Measurement of Releases of Carbon Monoxide from Stationary Sources</i> (EPS 1/RM/4, 1990) in conjunction with <i>Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources</i> (EPS 1/RM/8, 1993), both from Environment Canada; or iv. <i>Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code</i> (REF. 89), Alberta Environment v. <i>EPA Method 10 - Determination of carbon monoxide emissions from stationary sources</i>, August 2006; or vi. <i>EPA Method 10B - CO from Stationary Sources, Determination of carbon monoxide emissions from stationary sources</i>, February 2000; or vii. <i>State of California Air Resources Board (CARB) Reference Method 10 for the Determination of Carbon Monoxide Emissions from Stationary Sources</i>, July 1999.
Nitrogen oxides (NO _x) measured as NO ₂	<ul style="list-style-type: none"> i. <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers</i>, Reference Method EPS 1/RM/15, September 1990; or ii. <i>Method 7E, Determination of Nitrogen Oxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code</i> (REF. 89), Alberta Environment; or iii. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or

CCD-003 Renewable Low-Impact Electricity Products



Compound / Pollutant	Testing Methods
	<ul style="list-style-type: none"> iv. EPA Method 7 - Nitrogen Oxide (NO_x), Determination of nitrogen oxide emissions from stationary sources, February 2000; or v. EPA Method 7A - NO_x, Determination of nitrogen oxide emissions from stationary sources (Ion Chromatographic Method), February 2000; or vi. EPA Method 7B, Determination of nitrogen oxide emissions from stationary sources (Ultraviolet spectrophotometric method), February 2000; or vii. EPA Method 7C, Determination of nitrogen oxide emissions from stationary sources (alkaline permanganate/colorimetric method), February 2000; or viii. EPA Method 7D, Determination of nitrogen oxide emissions from stationary sources(alkaline-permanganate/ion chromatographic method), February 2000; or ix. EPA Method 7E, Determination of nitrogen oxides emissions from stationary sources (instrumental analyzer procedure), August 2006.
Particulate matter (PM)	<ul style="list-style-type: none"> i. Reference Method for Source Testing: Measurement of Releases of Particulate from Stationary Sources, Reference Method EPS 1/RM/8, December 1993; or ii. Method 5, Determination of Particulate Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or iii. EPA Method 5, Determination of particulate matter emissions from stationary sources, February, 2000
Sulphur oxides (SO _x) measured as SO ₂	<ul style="list-style-type: none"> i. Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-fired Boilers, Reference Method EPS 1/RM/15, September 1990; or ii. Continuous Emissions Monitoring (CEMS) Code (REF. 107), Alberta Environment; or iii. Reference Method for Source Testing: Measurement of Releases of Sulphur Dioxide from Stationary Sources, Report EPS 1-AP-74-3, September 1975; or iv. Method 6C, Determination of Sulphur Dioxide Emissions from Stationary Sources, in the Alberta Stack Sampling Code (REF. 89), Alberta Environment; or v. EPA Method 6, Determination of sulfur dioxide emissions from stationary sources, February 2000; or vi. EPA Method 6C, Determination of sulfur dioxide emissions from stationary sources (instrumental analyzer procedure), August 2006; or vii. EPA Approved alternative method Alt-001, SO₂ interference in methods 7 and 7A, May 1998.
Velocity and Volumetric Flow Rate	<ul style="list-style-type: none"> i. Method B - Determination of Velocity and Volumetric Flow Rate of Flue Gases, from Reference Method for Source Testing: Measurement of Release of Particulate from Stationary Sources (EPS 1/RM/8, 1993); or ii. Method 2, Determination of stack gas velocity and volumetric flow rate (types pitot tube), February 2007; or iii. Method 1, Sample and velocity traverses for stationary sources, February 2007.



Appendix 2: Load Point Determination

The process used to determine the load points for *operational air emissions* in this standard is based on a matrix of four environmental air emission parameters, each with a range of values based on actual industry performance. Each level of performance is assigned a specific load point value, and points are then totalled over all parameters. Products with different environmental profiles will thus be able to qualify under this standard. The allowable number of points has been set such that, while tradeoffs between parameters is possible, very poor performance in any one parameter will disqualify a *generation facility* as a supplier of electricity meeting the requirements of this standard.

The four parameters used to evaluate electricity generation under this standard for EcoLogo Program-certification are carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO_x) and sulphur oxides (SO_x). Load point calculations will be based on measured air emissions quantities of these compounds released as a result of only those operations directly used to generate electricity. The air emission measurements must represent annual emissions normalized to a per MWh basis, and include more than one datum point.

Measured emissions data and the quantity of annual electricity generated must be documented in Part 1: Measured Data, and load points must then be determined by using Part 2: Load Point Calculation. The load point for each compound must be taken from the top of each column corresponding to the emissions range for that compound's kilogram per MWh value.

CCD-003 Renewable Low-Impact Electricity Products



PART 1: MEASURED DATA

Using the table provided:

Enter the Annual Quantity of Electricity Generated (in *MWh*) by the *generation facility*. This quantity must be measured net of all parasitic loads from the *generation facility*, and net of transformer and line losses up to the point of connection to the *utility grid* or the *user's* system (if directly connected).

Enter the Annual Measured Quantity of *CO*, *PM*, *NO_x* (measured as *NO₂*) and *SO_x* (measured as *SO₂*) emitted (in kilograms), noting that appropriate test methods and the prescribed frequency and conditions of testing are provided in Appendix 1 for each compound.

Determine the Annual Measured Quantity per *MWh* of *CO*, *PM*, *NO_x* (measured as *NO₂*) and *SO_x* (measured as *SO₂*) emitted (in kilograms per *MWh*). These values will be used in the Load Point Calculations in Part 2.

Annual Electricity Generation (in <i>MWh</i>)	Compound	Annual Measured Quantity (in kg)	Annual Measured Quantity per <i>MWh</i> (in kg/ <i>MWh</i>)
	CO		
	PM		
	NO _x (as NO ₂)		
	SO _x (as SO ₂)		

CCD-003 Renewable Low-Impact Electricity Products



PART 2: LOAD POINT CALCULATION

Assign the load point value to each compound by taking the value at the top of each column corresponding to the emissions range for that compound's kilogram per megawatt-hour value determined in Part 1.

Determine the Total Load Points by summing the four individual load point values.

Compound	Load Points ³					Assigned Load Points
	0	1	2	3	8	
CO	≤ 2.15 kg/MWh	2.151 – 3.22 kg/MWh	3.221 – 4.30 kg/MWh	4.301 – 5.37 kg/MWh	> 5.371 kg/MWh	
PM	≤ 0.23 kg/MWh	0.24 - 0.39 kg/MWh	0.40 - 0.52 kg/MWh	0.53 - 0.65 kg/MWh	> 0.66 kg/MWh	
NO _x (as NO ₂)	≤ 0.77 kg/MWh	0.78 - 1.2 kg/MWh	1.3 - 1.5 kg/MWh	1.6 - 1.9 kg/MWh	> 2.0 kg/MWh	
SO _x (as SO ₂)	≤ 0.6 kg/MWh	0.7 - 0.9 kg/MWh	1.0 - 1.2 kg/MWh	1.3 - 1.5 kg/MWh	> 1.6 kg/MWh	
TOTAL LOAD POINTS						

³ Further to research conducted by the EcoLogo Program, threshold values for Carbon Monoxide (CO) have been revised from the version published in 2010.

Initial 2010 values were:

0 load points- ≤ 0.75 kg/MWh, 1 load point- 0.76-1.1 kg/MWh, 2 load points- 1.2-1.5 kg/MWh, 3 load points- 1.6-1.9 kg/MWh, 8 load points- ≥ 2.0 kg/MWh